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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,816	11/12/2003	Joeri Lof	081468-0306525	5408

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EXAMINER

LIVEDALEN, BRIAN J

ART UNIT PAPER NUMBER

2878

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/705,816	LOF ET AL.	
	Examiner	Art Unit	
	Brian J. Livedalen	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 9-20, 22-24 and 26-33 is/are rejected.
- 7) ☒ Claim(s) 4, 8, 21 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/10/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to amendment filed 4/10/2006. Claims 1-33 are pending.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the measurement system being configured to measure the location of the reference at an exposure position must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 11, 18, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Binnard (2006/0023186).

In regard to claims 1 and 18, Binnard discloses (fig. 2) a lithographic projection apparatus having a support structure (fig. 1, 18) configured to hold a patterning device (28), the patterning device configured to pattern a beam of radiation according to a desired pattern (page 2, paragraph 0024); a substrate table (218) configured to hold a substrate (208); a projection system (16) configured to project the patterned beam onto a target portion of the substrate; a liquid supply system (26) configured to provide a

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liquid (212) in a space between the final element of the projection system and the substrate; and a measurement system (220) configured to measure, not through the liquid, the location of each of a plurality of points on a substrate (page 3, paragraph 0037). Because Binnard discloses using a CCD camera to align the substrate, it is inherent that Binnard measures multiple points on the substrate. Furthermore, the method of claim 18 is inherent from the apparatus as set forth because the method is necessarily performed for the apparatus to function as disclosed.

In regard to claim 11, and 28, Binnard discloses (figs. 4a and 4b) an exposure station (16) at which the substrate may be exposed and a separate measurement station (420), the measurement system being provided at the measurement station and the substrate table being movable between the exposure and measurement stations (page 5, paragraph 0043).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5-7, 13, 19, 20, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Binnard (2006/0023186) as applied to claims 1 and 18, in view of Hirayanagi (6521900).

In regard to claims 2, 3, 5-7, 19, 20, 22-24, Binnard discloses a lithographic projection apparatus with a measurement system as set forth above. Binnard remains

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silent regarding the substrate table and substrate having reference marks. However, Hirayanagi discloses (fig. 1(a)) an alignment system with a wafer having reference marks and a substrate table having a reference mark, wherein the system determines the position of the substrate with respect to the substrate table (column 7, lines 7-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use reference marks on the substrate and substrate table in order to consistently and more accurately align the substrate with respect to the substrate table.

In regard to claim 13, Binnard further discloses that the reference includes a transmission image sensor (page 3, paragraph 0037).

Claims 9, 10, 14-17, 26, 27, and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Binnard (2006/0023186) as applied to claims 1 and 18, and in view of Hasegawa et al. (6144719).

In regard to claims 9, 10, 26, and 27, Binnard discloses a lithographic projection apparatus with a measurement system as set forth above. Binnard remains silent regarding a level sensor configured to measure the height and/or tilt of each of a plurality of points on the substrate by projecting a leveling beam onto the substrate and detecting the leveling beam as reflected by the substrate. However, Hasegawa discloses (fig. 17) a lithography system with a level sensor configured to measure the height and/or tilt of each of a plurality of points on the substrate by projecting a leveling beam onto the substrate and detecting the leveling beam as reflected by the substrate (column 14, lines 23-44). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to use a level sensor in order to increase the accuracy of the lithography process.

In regard to claims 14, 15, 30, and 31, Binnard discloses a lithographic projection apparatus with a measurement system as set forth above. Binnard remains silent regarding mapping the substrate from the location of the plurality of points and a controller configured to control the position of the substrate, using the map, during the exposure of the substrate through the liquid. However, Hasegawa discloses (fig. 22) mapping the substrate from the location of the plurality of points and a controller configured to control the position of the substrate (column 17, lines 4-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to map the points to control the movement of the substrate in order to more accurately align the substrate with the mask,

In regard to claims 16 and 32, Binnard further discloses an off-axis alignment system to measure the location of each of the plurality of points (page 3, paragraph 0037).

In regard to claims 17 and 33, Binnard in view Hasegawa discloses a lithographic projection apparatus with a measurement system as set forth above. Binnard remains silent regarding a level sensor configured to measure the height and/or tilt of each of a plurality of points on the substrate by projecting a leveling beam onto the substrate and detecting the leveling beam as reflected by the substrate. However, Hasegawa discloses (fig. 17) a lithography system with a level sensor configured to measure the height and/or tilt of each of a plurality of points on the substrate by projecting a leveling

beam onto the substrate and detecting the leveling beam as reflected by the substrate (column 14, lines 23-44). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a level sensor in order to increase the accuracy of the lithography process.

Claims 12 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Binnard (2006/0023186).

In regard to claim 12, and 29, Binnard discloses (figs. 4a and 4b) an exposure station (16) at which the substrate may be exposed and a separate measurement station (420), the measurement system being provided at the measurement station and the substrate table being movable between the exposure and measurement stations (page 5, paragraph 0043). Binnard fails to disclose using multiple substrate tables. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple substrate tables in order to enable faster production.

Allowable Subject Matter

Claims 4, 8, 21, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claims 4, 8, 21, and 25 are neither anticipated nor made obvious by the prior art of record. The prior art fails to disclose a lithographic apparatus and method as set

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forth wherein the measurement system is configured to measure the location of the reference at an exposure position, where if the reference is not measured through the liquid a correction is applied to the measurement of the location.

Response to Arguments

Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

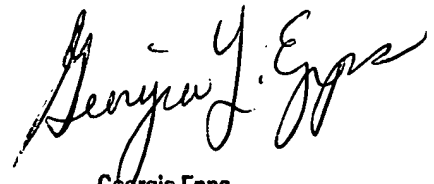
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Livedalen whose telephone number is (571) 272-2715. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bjl

A handwritten signature in black ink, appearing to read "Georgia Epps", is positioned above the printed name and title.

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800